REMARKS

Claims1-20 are pending in the present application. Claims 1-20 stand rejected. Claims 1-3, 6-9, and 12-19 have been amended. Claims 1, 8, 13 and 17 are the independent claims. Favorable reconsideration is requested.

Claims 8-20 stand rejected under 35 U.S.C. §101. In view of the amendments to independent claims 8, 13 and 17, these rejections should be removed.

Claims 1, 2, and 5-14 stand rejected under 35 U.S.C. §103(a) as being anticipated by Summerell et al., U.S. Patent No. 5,937,387 ("Summerell") in view of Tanaka, et al., U.S. Published Patent Application No. 2002/0133441 ("Tanaka"). Additionally, claims 3-4 and 15-20 stand rejected under 35 U.S.C. §103(a) as being anticipated by Summerell in view of Tanaka, and further in view of Hammond et al., U.S. Patent No. 5,613,072 ("Hammond"). In view of the amendments to the independent claims, Applicants respectfully submit that the foregoing claim rejections should also be removed.

As set forth in detail in the present application, Applicants' invention is directed to embodiments of a system and method for determining the relative importance of predictive variables that contribute to an overall insurance policy profitability score. *Specification* at Abstract. Initially, a pool of data, being values of a set of variables, is collected. *Specification* at [0004 - 0006].[1] A multivariate statistical predictive model can then generated from this large set of data. *Id.* In creating the predictive model, a subset of these original variables can be selected from this larger pool of variables for their statistical significance to the likelihood that a particular policyholder will have future losses. *Id.* Such selected variables are known as the "predictive variables." Once selected from the larger pool of variables, each of the predictive

[1] [1] All citations herein to the present specification are to the published version thereof, *i.e.*, U.S. Patent Application Pub. No. 2003/0101080).

variables can be assigned a weight, and an overall scoring formula can be expressed which is the sum of all such {predictive variable + weighting co-efficient} pairs. *Id.* The scoring formula can be created so as to best predict profitability (which is generally inversely proportional to predicted losses) based on complex statistical and actuarial transformations. *Id.* The scoring model can thus be used by insurers to determine in a more precise manner, using actual historical claims data, the risk associated with a particular policyholder. *Specification* at [0012 – 0013].

The system and method of the presently claimed invention evaluate a scoring formula to determine the relative contribution of each of one or more individual predictable variables used in the scoring formula to the overall score generated by the scoring formula. The system and method of the present claimed invention also quantify the contribution of each predictive variable to the score generated by the model by populating a database associated with the system with a mean value and standard deviation value for each of the plurality of variables, calculating a slope value for each of the plurality of variables, calculating a deviance based on the slope and standard deviation for each of the plurality of variables and multiplying the deviance value and slope value for each of the plurality of variables to quantify the contribution of each of the plurality of variables to the score. The quantified contribution may then be used to rank the variables by importance to the overall score.

Summerell describes a system and method for developing a customized wellness plan for measuring a user's wellness by determining a user's physiological age. The interactive wellness system and method described in Summerell collects information relating to the user's voluntary choices, habits, environments, disease transitions and genetic dispositions (wellness factors) and measures the user's wellness by determining his or her physiological age. In addition, the system and method of Summerell is capable of presenting the user with expert knowledge, know-how and resources to improve wellness, allowing the user to determine the effects varying combinations of wellness options could have on physiological age, allowing the

user to choose the combination of wellness options that he or she wishes to follow, monitoring the user's progress toward improving wellness by measuring physiological age and incorporating new medical data and new user data into the system.

The physiological age of Summerell, if relevant to the claimed invention, is at best an overall score, albeit not derived from a multivariate statistical model. Summerell is admitted by the Office Action as not describing the present invention as claimed in independent claim 1. As the Office Action admits, Summerell nowhere teaches or suggests automatically calculating the relative contribution of any of the plurality of predictive variables used in a scoring formula based on the calculated slope and deviance values of said predictive variables and displaying such relative contributions to a user.

Thus, Summerell, for example at 16:13-35 is not utilizing a multivariate statistical model optimized on a set of historical policyholder and claims data, but rather Summerell is utilizing deviations from "standard survival values." Predetermined relative risk factors are used to modify the survival rate and mortality rate of the standard population in order to assess the physiological age of a user – not actual historical data gleaned from claims data being processed (*i.e.*, the claimed set of values associated with a set of input variables) -- to identify a set of predictive variables as in the claimed invention. The contribution of these relative risk factors is not calculated as part of the assessment of the physiological age. No multivariate statistical model is created from the various relative risk factors in Summerell so as to identify a set of predictive factors and generate a scoring formula based thereon, said scoring formula comprising at least a sum of a plurality of predictive variables each having a weighting co-efficient. As a result, Summerell is neither concerned with a scoring formula being a multivariate statistical model generated from an initial set of data nor with the importance of each contributing variable in such model. Rather, Summerell is instead focused on the final end result of a calculated physiological age.

In fact, the difference between Summerell and the claimed invention is clearly illustrated by comparing Table Two of Summerell with Fig. 5 of the present application specification. The relative risk, first relative risk adjustment and second relative risk assessment (columns 2, 4 and 6, respectively) in Table Two of Summerell are not even remotely comparable to the Importance (column 5) and Rank (column 6) of Fig. 5 of the present Specification. As such, Summerell does not teach or suggest means for calculating the contribution of any of the plurality of variables based on the calculated slope and deviance values according to the present invention.

Because Summerell deals with adjustments to ***general*** medico-health risk data, as opposed to finding precise weightings to identified predictive variables gleaned from a larger set of variables (and their actual values) which has been used to generate a multivariate statistical model, Applicants respectfully traverse the notion that by simply re-arranging the equations provided in Summerell one would obtain the presently claimed invention. Summerell's equations are not a calculus for the same information (or its equivalent, even) being processed in the claimed invention; thus the teaching of Summerell is respectfully asserted as fundamentally and quantitatively different than the claimed invention.

The Office Action seeks to correct the deficiencies of Summerell as a reference against the pending claims with Tanaka, asserting that Tanaka discloses "a process of generating a multivariate statistical model from the values in the database and a scoring formula based thereon." Office Action at 12. Applicants respectfully traverse.

Tanaka describes comparing outcomes of financial processes with modeled outcomes:

> [0015] Another aspect of the invention includes a method for comparing the actual outcomes of the financial process (e.g., charges submitted, payments received) with modeled outcomes. Creation of the models can be performed either by the user or through the applied use of any suitable third party software designed for such use (*e.g.*, CHARGEMASTER™). All relevant data elements

> are plotted on a X-Y coordinate graph with the modeled data arranged along the X-axis and the actual responses arrayed along the Y-axis. It is to be appreciated by even casual users that a model which accurately predicts the outcome will be characterized by a diagonal line characterized by a slope of 1 and a regression (r, a measure of variance) of 1.0. Statistically significant departure from the model indicates a need to perform follow-up statistical analyses to identify the most likely source(s) of the error. In this connection, it should be noted that significant deviations in slope often indicate single process errors while large variances about the common slope indicate the present of multiple error factors.
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> [0016] Assessing the relative contribution of each factor in the model together with the separate influence or impact of process errors (e.g., site of service) is achieved through the separate application of multivariate analysis. For example, in the healthcare industry, it may be desirable to determine why one site of service, such as a clinic, receives payment on insurance claims faster than another site of service. Conventional single-variable statistical analysis may be unsuitable for making this determination. However, multivariate analysis allows the user to assess the statistical likelihood that a factor or combination of factors contributes to the model's outcome or reduces model error. Once the statistically relevant factors are identified, each factor (or combination thereof) in the model is perturbed (adjusted by an arbitrary amount, typically by 10% of its nominal value) and the new model compared to the actual outcomes. This reiterative process is continued until the factor(s) most responsible for the residual error are identified. For example, in the clinic site time of payment scenario discussed above, multivariate analysis may indicate that clinic A receives payment on claims before clinic B because clinic A meets on Mondays and clinic B meets on Fridays. .

Tanaka at ¶¶ [0015-0016] (emphasis added).

Thus, Tanaka does not describe the creation of a multivariate individually weighted scoring formula from the larger set of collected data and then assessing the contributions to the formula of the various variables in the formula using various derived quantities from said predictive variables and their respective weights in the model, as in the claimed invention. Thus, Tanaka does not calculate for example, a set of calculated partial derivative and deviance values for each predictive variable so as to quantify the contribution of each such predictive variable, as in claim 1. Tanaka goes outside of the model itself to assess the accuracy of the model. Tanaka assumes a less than accurate model is created, and then, to better train the model, uses perturbations of that model compared with actual outcomes until the factors most responsible for the residual [model] error are identified.

Tanaka is thus tweaking its model (and not specifically an individually weighted multivariate statistical model, as in the claimed invention) using hindsight -- based on subsequently acquired data. In contrast, the claimed invention only utilizes past collected data to generate a model, and then quantifies the contribution of each of the variables chosen to be in the model (scoring formula) to the overall score. No additional data is needed to perform the claimed invention. In Tanaka the "variance" being measured – as in Fig. 2, "analysis of variance contributing factors" -- is the variance of the predicted results from the actual results, not a "variance" in the statistical sense based solely on the data available at the time the model was created. Tanaka at ¶ [0051], cited by the Examiner, corroborates this reading. The model is corrected based on the "variance" calculated. The individual contributions of individual variables to some overall score within the assumptions of the model itself, is of no concern.

It should be recalled that the purposes and aims of Tanaka and the claimed invention are significantly different. The claimed invention generates a multivariate statistical model from values in a large database and a scoring formula based thereon. The scoring formula is assumed accurate, and the claimed invention is merely concerned with calculating the contribution of individual variables used in the model. This contribution is not immediately obvious to anyone using the model, such as, for example, an insurance agent, or a potential insured who queries the agent as to why he has received a low profitability score and was thus quoted with a high premium. The answer to such queries is the aim of the claimed invention, not how to better train a scoring formula, as in Tanaka. The claimed invention provides that such an optimized scoring formula be created, or already exists, and thus, in the claimed invention, such scoring formula needs no further tweaking as per the teaching of Tanaka.

Finally, Hammond does not teach or suggest the creation of a multivariate individually weighted scoring formula from a larger set of collected data and then the assessment of the contributions to said scoring formula of the various individual variables in the formula.

Hammond does not teach quantifying the contribution of each of the plurality of predictive variables to the score using various derived quantities from said predictive variables and their respective weights in the formula, as in the claimed invention. Thus, Hammond cannot cure the deficiencies of either Summerel or Tanaka, taken individually or in combination, as a reference against the independent claims.

Thus, independent claims 1, 8, 13 and 17 are urged as patentable over Summerell, Tanaka and Hammond, whether taken alone or in any combination.

It is further submitted that dependent claims 6-7, 9-12, 14-16 and 18-20 are also allowable for similar reasons.

As noted above, Applicants respectfully submit that this application is now very close to, if not in, condition for allowance. Applicants take the Examiner's much appreciated constructive comments in the "Response to Remarks" section of the Office Action at p. 4 as the Examiner's sense that this is true. To insure that any open issues are addressed as quickly as possible, Applicants would like a personal interview to discuss the currently claimed invention with the Examiner and his supervisor, address any remaining issues so as to obtain resolution of this long pending case (and file any Supplemental Amendment as may be necessary) without the necessity of another Office Action issuing. Applicants do note that given the complicated mathematical expressions in the cited art as well as in the claimed invention, it is somewhat difficult to demonstrate conclusively solely *in writing* how the cited art fundamentally and qualitatively differs from the claimed invention without writing a learned treatise of such length and copious analysis that would strain the patience of even the most earnest reader. Applicants' undersigned attorneys will contact the Examiner shortly to arrange such a discussion.

No other fees are believed due in connection herewith. Please charge any fee deficiency or credit any overpayment to the undersigned attorneys' Deposit Account No. 50-0540.

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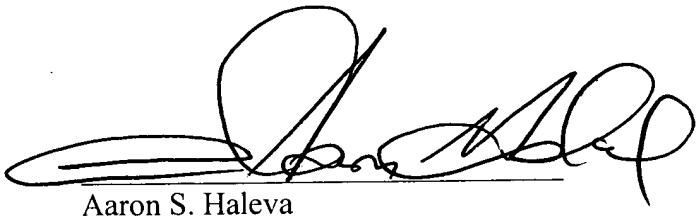
Respectfully submitted,



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